A toy apparatus and a method for using the same are provided. The toy and the method for using the same include a disc of rubber-like buoyant material. The disc has an upper convex surface and a lower convex surface. The upper convex surface and the lower convex surface are symmetrical. A user throws the disc through water. If the disc is thrown from a starting point that is underwater, the disc travels in a pattern such that the disc ends in the general area of the user. If the disc is thrown from a starting point above the water, the disc travels in a pattern such that the disc enters the water and ends in the general area of entry into the water.
DISC AND A METHOD FOR USING SAME

BACKGROUND OF THE INVENTION

[0001] The present invention generally relates to a toy or an amusement device and a method for using the same. More specifically, the present invention relates to a disc apparatus to throw through water.

[0002] Games involving physical activity are well known. For example, many toys are known which involve throwing an object back and forth between two or more individuals. These thrown objects, such as baseballs, softballs, basketballs, footballs, beach balls and frisbees may have a variety of shapes and sizes and are made of various materials. These thrown objects may have different travel patterns through the air based on shape, size and material. Thus, thrown objects may be difficult to throw to another individual. Thrown objects typically follow a linear flight path which makes use of the thrown object repetitive and renders the game tiresome. Also, thrown objects typically require participation from another individual. Often, a second individual may not be present to enjoy use of the thrown object.

[0003] Furthermore, if a thrown object fails to reach the other individual, then the thrown object normally must be retrieved, which often interrupts game play and lessens the enjoyment of the individuals. A toy may be difficult for the player to throw in a flight pattern wherein the toy travels to the general area of the other player, especially if the players are children. If a single player throws a toy without participation from another individual, the toy normally comes to rest at a distance from the player. Therefore, a single player only uses the toy again if the player leaves the location from where the toy was thrown and retrieves the toy.

[0004] It is also generally known to provide a boomerang-type toy, which is thrown through the air in a flight path such that the toy returns to the general area of its release. However, throwing the toy and obtaining the desired flight path is often difficult and requires a precise throwing motion. Also, a traditional boomerang normally has a V-shaped structure that makes the flying boomerang unstable and subject to undesired flight interruption, such as, for example, if the boomerang encounters wind, the ground or water.

[0005] Furthermore, it is generally known to provide aquatic toys for the fun and amusement of one or more users. Aquatic games combine the amusement of the game with the enjoyment of the water. Generally, aquatic toys either sink to the bottom and must be retrieved; or, aquatic toys float on the water surface. Thus, if the aquatic toy is thrown between users, an errant throw may create the hindrance of retrieving the toy. Furthermore, the aquatic toys may not provide amusement if only one user is present.

[0006] A need, therefore, exists for an improved toy and method for using the same that returns to a user when thrown through water, enhancing play value by allowing continued game play and allowing the toy to be used both when the player is alone and when other players participate.

SUMMARY OF THE INVENTION

[0007] The present invention generally relates to an apparatus and a method for using the same having a disc-like body. The disc-like body has an upper convex surface and a lower convex surface. The apparatus is made from a rubber-like buoyant material such that, if the apparatus is thrown through water, the apparatus travels in a pattern wherein the apparatus returns to a general area of the user.

[0008] In an embodiment of the present invention, an apparatus is provided. The apparatus has a disc constructed from a buoyant material wherein the buoyant material is nonporous and flexible. The disc has an upper convex surface and a lower convex surface wherein the upper convex surface has an upper apex and the lower convex surface has a lower apex. The upper convex surface and the lower convex surface are symmetrical. The disc has an interior defined between the upper convex surface and the lower convex surface wherein the interior is the buoyant material.

[0009] In an embodiment, the buoyant material is a thermoplastic elastomer.

[0010] In an embodiment, the buoyant material is a thermoplastic vulcanizate.

[0011] In an embodiment, the buoyant material is a polyolefin-based thermoplastic vulcanizate.

[0012] In an embodiment, the disc is a single molded piece of the buoyant material.

[0013] In an embodiment, the disc is sized to fit between a thumb of a user and at least one other finger of the user.

[0014] In another embodiment, the apparatus has a disc constructed from a buoyant material wherein the disc has an upper convex surface, a lower convex surface, a perimeter edge and a radius. The disc has an interior defined between the upper convex surface and the lower convex surface wherein the interior is the buoyant material. The upper convex surface has an upper apex, the lower convex surface has a lower apex and the upper convex surface and the lower convex surface are symmetrical. A distance between the upper apex and the lower apex defines a height of the disc and the radius is larger than the height.

[0015] In an embodiment, the disc has a center point and a perimeter edge wherein the perimeter edge is equidistant from the center point.

[0016] In an embodiment, the upper convex surface and the lower convex surface are identically shaped and sized.

[0017] In an embodiment, the upper convex surface and the lower convex surface are identically shaped and sized.

[0018] In an embodiment, the perimeter is equidistant from a center point of the disc and further wherein a distance from the upper apex to the center point is equal to a distance from the lower apex to the center point.

[0019] In an embodiment, the perimeter edge is equidistant from the upper apex and further wherein the perimeter edge is equidistant from the lower apex.

[0020] In an embodiment, the radius is between 0.5 inches and 6 inches.

[0021] In an embodiment, the height is between 0.5 inches and 6 inches.

[0022] In an embodiment, a ratio of the radius to the height is between 1:1 and 6:1.

[0023] In an embodiment, a mass of the toy is between 0.5 pounds and 3 pounds.

[0024] In another embodiment, a method is provided for using an aquatic toy comprising the steps of: providing a disc constructed from buoyant material wherein the disc is symmetrical around an axis of rotation and the buoyant material is nonporous and flexible; and throwing the disc from a general area defining a point of release wherein throwing the disc imparts spin to the disc around the axis of rotation, the disc travels through the water and returns to the general area of the point of release.
In another embodiment, a method is provided for using an aquatic toy wherein the point of release is under water.

In another embodiment, a method is provided for using an aquatic toy wherein the point of release is above water.

In another embodiment, a method is provided for using an aquatic toy wherein the buoyant material is a thermoplastic elastomer.

In another embodiment, a method is provided for using an aquatic toy wherein the buoyant material is a thermoplastic vulcanizate.

It is, therefore, an advantage of the present invention to provide an apparatus and a method for using same wherein a user may throw a disc through water, and the disc returns to the user.

Another advantage of the present invention is to provide an apparatus and a method for using same wherein a disc may travel with continuous movement back to the user. Another advantage of the present invention is to provide an apparatus and a method for using same wherein the user obtains a desired disc travel pattern ending at the general point of release with ease.

Another advantage of the present invention is to provide an apparatus and a method for using same wherein the apparatus is used in a pool.

Additional features and advantages of the present invention are described in, and will be apparent from, the detailed description of the presently preferred embodiments and from the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevated view of an embodiment of the apparatus of the present invention.
FIG. 2 is a side view of an embodiment of the apparatus of the present invention.
FIG. 3 is a perspective view of an embodiment of the apparatus of the present invention.
FIG. 4 is a view of use of an embodiment of the apparatus wherein the starting point of a throw of the apparatus is underwater.
FIG. 5 is a view of use of an embodiment of the apparatus wherein the starting point of a throw of the apparatus is above the water.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention generally relates to a toy or an amusement device and a method for using the same. More specifically, the present invention relates to a disc apparatus for throwing through water wherein the apparatus returns to the general area of the user.

Referring now to the drawings wherein like numerals refer to like parts, FIG. 1 is an elevated view of an embodiment of the apparatus of the present invention; FIG. 2 is a side view of an embodiment of the apparatus of the present invention; and FIG. 3 is a perspective view of an embodiment of the apparatus of the present invention. As generally illustrated in FIG. 1-3, the apparatus may be a toy 1. The toy 1 has a body 2 wherein the body 2 may have a disc-like shape. The toy 1 may be integrally formed wherein the body 2 is formed from a single piece of material. The body 2 may be solid in that the body 2 has material throughout the entirety of the body 2.

Preferably, the body 2 may have a uniform composition of material throughout the entirety of the body 2. The body 2 may be manufactured through an injection molding process.

As illustrated in FIG. 2, the body 2 has an upper convex surface 3, a lower convex surface 4 and a perimeter edge 5. The perimeter edge 5 of the body 2 may be circular such that the perimeter edge 5 may be equidistant from a center 6 of the body 2 and the perimeter edge 5 and the center 6 form a radius 7 of the body 2. The body 2 may also have a curvature. As illustrated in FIG. 2, the curvature of the body 2 may form an upper apex 8 and a lower apex 9. The body 2 may be symmetrical wherein the upper convex surface 2 and the lower convex surface 3 may be identically shaped and sized. Moreover, the perimeter edge 5 may be equidistant from both the upper apex 8 and the lower apex 9.

The user may throw the toy 1 using one hand wherein the body 2 of the toy 1 may be oriented in any direction. The user may throw the toy 1 by placing a thumb on the upper convex surface 2 and one or more other fingers on the lower convex surface 3. The body 3 may be shaped so that the curvature may be small enough to provide a grip of the toy 1 by the user placing the thumb on the upper convex surface 2 and placing one or more other fingers on the lower convex surface 3 without strain of the hand. The user may throw the toy 1 with a backhand motion or a forehand motion and may throw the toy 1 with a sidearm, an overhanded or an underhanded arm motion. The user may end the throwing motion by a snap of the wrist of the hand grasping the toy 1 wherein the snap of the wrist may impart a top-like spin upon the toy 1.

After the toy 1 is thrown, the body 2 of the toy 1 may have top-like spin around an axis of rotation. The symmetrical disc-like structure of the body 2 of the toy 1 may provide the top-like spin as the toy 1 travels through the water. Alternatively the toy 1 may not have top-like spin as the toy 1 travels through the water. The top-like spin around the axis of rotation may provide angular momentum around the axis of rotation. The angular momentum may reverse the movement of the toy 1 away from the user. After the angular momentum reverses the movement of the toy 1 away from the user, the angular momentum may further provide movement of the toy 1 in a direction towards the user.

The body 2 of the toy 1 may be rubber-like buoyant material. The rubber-like buoyant material may allow the toy 1 to travel through the water. When thrown through the water, the toy 1 may have movement in a direction that may be upward as a result of the rubber-like buoyant material. Preferably, the toy 1 may be integrally formed wherein the body 2 of the toy 1 may be the same piece of rubber-like buoyant material. Preferably, the body 2 of the toy 1 may be a solid disc wherein the rubber-like buoyant material may be present throughout the entirety of the body 2 of the toy 1. Preferably, the body 2 may have the same density of rubber-like buoyant material throughout the entirety of the toy 1. Preferably, the rubber-like buoyant material may be nonporous wherein water may not enter the body 2 of the toy 1. The rubber-like buoyant material may also be flexible. The body 2 of the toy 1 may be constructed and/or designed from a material that may be safe for the user to catch and/or use.

More specifically, the rubber-like buoyant material may be a thermoplastic elastomer. The thermoplastic elastomer is a reversibly cross-linked polymer and may provide rubber-like qualities and/or plastic-like processing efficiency. Therefore, the thermoplastic elastomer may be used in inject-
tion molding processes, such as the preferred method of manufacture of the toy. The thermoplastic elastomer may provide buoyancy to the toy if the density of the thermoplastic elastomer is less than the density of water. The thermoplastic elastomer may be nonporous that may prevent water from entering the body of the toy. The thermoplastic elastomer may be flexible, but may also be resistant to tear and/or deformation. In addition, the thermoplastic elastomer may have chemical resistance which may provide consistent physical properties in acid, base or aqueous media and may have fluid resistance. The thermoplastic elastomer may, therefore, provide a nonporous material that may prevent entry of water or other fluids into the material. Furthermore, while a rubber-like buoyant material may have a high coefficient of friction relative to other materials such as plastics, a thermoplastic elastomer may provide a lower coefficient of friction relative to other rubber-like buoyant materials. Friction of the toy against surrounding water may hinder travel of the toy through the surrounding water and prevent the toy from obtaining a desired pattern of travel. The body 2 may be constructed from a rubber-like buoyant material with a lower coefficient of friction and may, therefore, travel through water in a desired pattern.

The rubber-like buoyant material of the body 2 of the toy may be thermoplastic vulcanize, a thermoplastic elastomer with a chemically cross-linked rubbery phase produced by dynamic vulcanization. Thermoplastic vulcanizates are well known in the art. Fluid resistance of the thermoplastic vulcanize may provide a capability of the toy 1 to follow the desired pattern of travel. Flexibility of the thermoplastic vulcanize may provide safety for the user of the toy 1 during use, such as the contact of the hand of the user with the toy if the user catches the toy 1. Flexibility of the thermoplastic vulcanize may provide a resistance to impact to the body 2 of the toy 1. Furthermore, durability and stability of thermoplastic vulcanize may provide a capability of the toy 1 to obtain the desired pattern of travel despite age of the toy 1 and/or despite exposure of the toy 1 to its environment, such as chlorinated water, for example.

More specifically, the thermoplastic vulcanize may be "SANTOPORENE", "SANTOPORENE" is a registered trademark of the Monsanto Corporation of St. Louis, Mo.

The rubber-like buoyant material of the body 2 of the toy may be SANTOPORENE TPV 201-55, a soft, colorable thermoplastic polyolefin-based vulcanize. SANTOPORENE thermoplastic vulcanize may provide a low coefficient of friction relative to other rubber-like buoyant materials. In an embodiment, if the rubber-like buoyant material of the body 2 of the toy 1 is the thermoplastic polyolefin-based vulcanize, such as, for example, STYROPORPRENE TPV 201-55, the chemical resistance, the buoyancy and/or the nonporous structure of the rubber-like material may provide a capability of the toy 1 to follow the desired pattern of travel.

As illustrated in FIG. 4, the toy 1 may be thrown underwater by a user 10 from a release point 11. The toy 1 may travel in a pattern such that the toy 1 moves away from the user to a reversal point 12. At the reversal point 12, the top-like spin of the body 2 of the toy 1 and the angular momentum created by the top-like spin may halt the movement of the toy 1 away from the user. The top-like spin of the toy 1 may also provide movement of the toy 1 from the reversal point 12 to the general area of the release point 11.

As illustrated in FIG. 5, the toy 1 may be thrown by a user 13 from a release point 14 above the water. The toy 1 may travel in a pattern such that the toy 1 enters the water at a water entry point 15 and moves away from the user to a reversal point 16. At the reversal point 16, the top-like spin of the body 2 of the toy 1 and the angular momentum created by the top-like spin may halt the movement of the toy 1 away from the user 13. The top-like spin of the toy 1 may also provide movement of the toy 1 from the reversal point 14 to the general area of the release point 14.

Preferably, the toy 1 may have a distance from the upper apex 8 to the lower apex 9 smaller than the radius 7. The difference in the radius 7 and the distance from the upper apex 8 to the lower apex 9 may decrease resistance and/or drag as the toy 1 travels through water. The ratio of the radius 7 to the distance from the upper apex 8 to the lower apex 9 may be, for example, between 1:1 and 6:1. In a preferred embodiment, the ratio of the radius 7 to the distance from the upper apex 8 to the lower apex 9 may be between 3:1 and 4:1. The distance from the upper apex 8 to the lower apex 9 may be, for example, between 0.5 inches and 6 inches. In a preferred embodiment, the distance from the upper apex 8 to the lower apex 9 may be between 0.5 inches and two inches.

Furthermore, the difference in the radius 7 and the distance from the upper apex 8 to the lower apex 9 may allow the toy 1 to have a mass that allows upward movement of the toy 1 due to the rubber-like buoyant material. A mass of the toy 1 that may be too large to be overcome by the buoyancy of the rubber-like buoyant material may cause the toy 1 to sink in surrounding water and may not obtain the desired pattern of travel. A mass of the toy 1 that may be too small to be overcome by the buoyancy of the rubber-like buoyant material may cause the toy 1 to float on the surface of the water upon release by the user and not obtain the desired pattern of travel. The radius 7 of the toy 1 that may be too large or small may not provide the toy 1 with angular momentum. As a result, the toy 1 may not obtain the desired pattern of travel. The radius 7 may be, for example, between 1 inch and 6 inches. In a preferred embodiment, the radius 7 may be between 3 inches and 4 inches.

A mass of the toy may be, for example, between 0.5 pounds and 3 pounds. In a preferred embodiment, the toy 1 may have a mass of approximately one pound. The curvature of the body 2 may provide more mass at the axis of rotation relative to the perimeter edge 4. More mass at the axis of rotation relative to the perimeter edge 4 may cause the toy 1 to travel in a stable orientation. The stable orientation of the toy 1 may be a maintained direction of the axis of rotation wherein the maintained direction of the axis of rotation may allow the desired pattern of travel of the toy 1.

In a preferred embodiment, the toy 1 may have a radius 7 of 3.5 inches, a distance from the upper apex 8 to the lower apex 9 of 1.0 inches and a mass of approximately one pound, although the present invention should not be deemed as limited to dimensions of this embodiment.

The toy 1 may have its mass dispersed across the body 2 from the axis of rotation to the perimeter edge 4. The dispersal of the mass of the toy 1 may provide a moment of inertia of the toy 1. The moment of inertia of the toy 1 may provide angular momentum around the axis of rotation of the toy 1 when the toy travels through water with top-like spin. The angular momentum of the toy 1 may reverse movement of the toy 1 away from the user and/or may cause movement of the toy 1 in a direction towards the user.
momentum of the toy 1 may provide a travel pattern of the toy 1 thrown from the release point 11 that may be underwater wherein the toy 1 returns to the general area of the release point 11. The angular momentum of the toy 1 may provide a travel pattern of the toy 1 thrown from a release point 14 that may begin above water wherein the toy 1 returns to the general area of the release point 14.

[0055] The toy 1 may be used by one user. The user may throw the toy 1 with different orientations of the toy 1, different throwing motions, at different speeds and/or from different release points to vary the travel pattern of the toy 1. The user may throw the toy 1 in a generally horizontal direction or downward. The return of the toy 1 to the general area of the user may allow use when the user is the only participant. Variances in travel patterns of the toy 1 may allow the user to enjoy continued use of the toy 1. If other players are present, the toy 1 may provide a game wherein the user throws the toy 1, and the other players attempt to grab the toy 1 during the travel pattern of the toy 1.

[0056] It should be understood that various changes and modifications to the presently preferred embodiments described herein will be apparent to those skilled in the art. Such changes and modifications may be made without departing from the spirit and scope of the present invention and without diminishing its attendant advantages. It is, therefore, intended that such changes and modifications be covered by the appended claims.

I claim:

1. A toy comprising:
   a disc constructed from a buoyant material wherein the buoyant material is nonporous and flexible and further wherein the disc has an upper convex surface and a lower convex surface wherein the upper convex surface has an upper apex and the lower convex surface has a lower apex and further wherein the upper convex surface and the lower convex surface are symmetrical wherein the disc has an interior defined between the upper convex surface and the lower convex surface wherein the interior is the buoyant material.
   2. The toy of claim 1 wherein the buoyant material is a thermoplastic elastomer.
   3. The toy of claim 1 wherein the buoyant material is a thermoplastic vulcanizate.
   4. The toy of claim 1 wherein the buoyant material is a polyolefin-based thermoplastic vulcanizate.
   5. The toy of claim 1 wherein the disc is a single molded piece of the buoyant material.
   6. The toy of claim 1 wherein the disc is sized to fit between a thumb of a user and at least one other finger of the user.

7. A toy comprising:
   a disc constructed from a buoyant material wherein the disc has an upper convex surface, a lower convex surface, a perimeter edge and a radius wherein the disc has an interior defined between the upper convex surface and the lower convex surface wherein the interior is the buoyant material and further wherein the upper convex surface has an upper apex and the lower convex surface has a lower apex and further wherein the upper convex surface and the lower convex surface are symmetrical and further wherein a distance between the upper apex and the lower apex defines a height of the disc and the radius is larger than the height.
   8. The toy of claim 7 wherein the disc has a center point and a perimeter edge wherein the perimeter edge is equidistant from the center point.
   9. The toy of claim 7 wherein the upper convex surface and the lower convex surface are identically shaped and sized.
   10. The toy of claim 7 wherein the perimeter is equidistant from a center point of the disc and further wherein a distance from the upper apex to the center point is equal to a distance from the lower apex to the center point.
   11. The toy of claim 7 wherein the perimeter edge is equidistant from the upper apex and further wherein the perimeter edge is equidistant from the lower apex.
   12. The toy of claim 7 wherein the radius is between 0.5 inches and 6 inches.
   13. The toy of claim 7 wherein the height is between 0.5 inches and 6 inches.
   14. The toy of claim 7 wherein a ratio of the radius to the height is between 1:1 and 6:1.
   15. The toy of claim 7 wherein a mass of the toy is between 0.5 pounds and 3 pounds.
   16. A method for using an aquatic toy, the method comprising the steps of:
   providing a disc constructed from buoyant material wherein the disc is symmetrical around an axis of rotation and the buoyant material is nonporous and flexible; and
   throwing the disc from a general area defining a point of release wherein throwing the disc imparts spin to the disc around the axis of rotation wherein the disc travels through the water and returns to the general area of the point of release.
   17. The method of claim 16 wherein the point of release is underwater.
   18. The method of claim 16 wherein the point of release is above water.
   19. The method of claim 16 wherein the buoyant material is a thermoplastic elastomer.
   20. The method of claim 16 wherein the buoyant material is a thermoplastic vulcanizate.

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